SCOPING MEETING SUMMARY
Wailuku, Maui, 9 March 1992, 2 PM Session

Mary S. Quinby-Hunt
6 June 1992

OVERVIEW

The meeting began with presentations by the facilitator, Mr. Spiegel, and Dr. Lewis, the program director from DOE. The facilitator introduced those on the podium. He then described the general structure of the meeting and its purpose: to hear the issues and concerns of those present regarding the proposed Hawaiian Geothermal Project. He described his role in ensuring the impartiality and fairness of the meeting. Dr. Lewis further defined the scope of the project, introduced members of the EIS team, briefly described the EIS process, and answered several process questions, noting that cable feasibility would be examined and that Native Hawaiian concerns would be addressed. Ms. Borgstrom stated that the EIS Implementation Plan will be continuously refined and that impacts of reasonably foreseeable future activities would be examined.

During the meeting, more than 90% of the commenters requested that the EIS identify and assess the relative merits and impacts of energy alternatives to the proposed action. Nearly 80% requested that the EIS investigate conservation and renewable forms of energy, such as wind, solar, and biomass. They suggested that integrated resource planning should be used, noting that the State is initiating such a process. More than 30% of the commenters asked that the EIS examine geothermal alternatives to the action including developing geothermal resources on Maui and using geothermal power on Hawai'i only on that island. One commenter proposed an alternative cable route that proceeds from Hawai'i to Lana'i and from Lana'i to Oahu with spur lines to Moloka'i and Maui as needed.

Nearly 70% of the commenters made general statements concerning potential short- and long-term environmental costs and impacts of the HGP (particularly on pristine environments). Others were concerned about environmental costs to Maui, particularly the impacts of a land-based cable route on the south side of Maui and on Hawaiian homestead lands.

More than half the commenters were concerned about the potential impacts of the HGP to cultural resources. They stated that the EIS should respect and address Native Hawaiian religious and cultural concerns noting that the lands from Ulupalakua to Kaupo are Native Hawaiian homelands replete with archeological sites and endangered plants used for rituals. Many (>30%) were concerned about impacts of the HGP on the life styles of the general population, in particular, on life styles of Native Hawaiians. Another 30% mentioned aesthetic impacts of HGP on pristine environments.

DISCLAIMER

Nearly 50% of the commenters had concerns about economic costs of the HGP project to users, non-users, and taxpayers. The EIS should address the economic impacts if the submarine cable affects big game fish and food stocks, or tourism. About 50% of the commenters had political concerns, noting their frustration, because they of loss their trust in government and loss of individual rights.

Many presenters (>40%) questioned the reliability of the submarine cable, asking if the submarine cable was feasible given the steepness, depth, bottom roughness and frequency of debris flows in the Alenuihaha channel. Others were concerned about sabotage and shark bites. Nearly a quarter of the commenters questioned the reliability of the geothermal facilities due to the effects of heavy rains, or seismic or volcanic events, on Hawai'i or Maui. Others expressed concern about the impacts of breaks in service, noting that loss of 500 MW would be a significant problem.

More than 30% of the presenters asked that the EIS address the impacts of reasonably foreseeable future uses of geothermal energy, such as seabed mineral mining and refining on Hawaii, a proposed space port, and development that might occur should power become available on Maui.

Another significant concern was raised regarding the impacts of the submarine cable on humpback whales (particularly nursing mothers and their offspring), an endangered species, which winter in the waters surrounding Maui, Moloka'i, Kahoolawe and Lana'i. The commenters believe that the EIS should investigate the impacts of the cable on humpback whale migration patterns, birthing patterns and rate, and ability to navigate and locate. Also mentioned were secondary effects such as the effects of nets (used to protect swimmers if the submarine cable attracts sharks) on humpback whales' birthing habits in shallow, protected waters.

Other environmental issues raised included the propriety of using Native Hawaiian homelands or ceded lands for HGP (~25%), and the need for characterization of geothermal emissions and effluents and their impacts. Some commenters were concerned about impacts of HGP on game, and threatened and endangered species, particularly those used for medicines and Native Hawaiian rituals. Others suggested that the EIS should investigate the impacts of the submarine cable installation, normal cable operation (emf effects), and cable failure (such as oil leakage) on sea turtles, big game fish, dolphins, food stocks, and sharks and on reefs and ocean ecology in the coastal zone where the submarine cable lands.

MEETING SUMMARY

Speigel Presentation - Attachment A

DOE Project/Process Description - Attachment B

Process Discussions.

Cable Feasibility. One person asked whether the feasibility of laying the cable would be questioned. Dr. Lewis replied that although DOE will rely heavily on the work sponsored by DOE and the State, the work by Pirelli, and the feasibility study by Noda and Makai Engineering, the conclusions about the feasibility of all aspects of the proposed action, including ithe cable, will be reviewed during preparation of the EIS.

Prior Geothermal Activities. When asked whether the EIS would consider the impacts of prior geothermal activities, Ms. Borgstrom stated that DOE will examine prior activities from the perspective of cumulative impacts, and DOE will also examine the impacts of reasonably foreseeable future impacts.

Implementation Plan. When asked if the EIS Implementation Plan would be reopened if it is found to be inadequate, Ms. Borgstrom replied that it is not really necessary to "reopen" the IP, as it is a living document and will be improved as necessary throughout the process. Dr. Lewis requested that the commenter follow the process, add his name to the mailing list, review the IP and other documents available in reading rooms, and comment to DOE.

Native Hawaiian Concerns. Dr. Lewis clarified the process with regard to Native Hawaiian concerns. He stated that while DOE would like to extend cooperating agency status to Native Hawaiians, DOE cannot as Native Hawaiian groups do not have "nation" status (as defined by Congress). However, to the extent possible, he stated that every effort would be made to extend that status, and respect and consider their concerns. He requested that someone arrange for him to speak with interested Maui-based Native Hawaiian organizations. He promised to arrange meetings with those groups as was done in Pahoa.

Studies and Consultants. With respect to EIS studies, Dr. Lewis explained that there is limited time and funding to do an EIS. It will be necessary when preparing the Implementation Plan to assess the urgency for raw data. In those areas where raw data is required and obtainable, DOE will do its best to conduct studies in the best way achievable. Dr. Lewis declared that during the process of preparing the EIS, DOE will choose the best qualified consultants and experts taking their track record into account. He requested that DOE would appreciate suggestions of those who are qualified. He also noted that DOE will reexamine old data. Dr. Lewis noted that several members of the EIS team plan to tour potentially-affected areas of southeast Maui as arranged by Maui County staff and requested suggestions on sites, individuals *etc*. to visit.

PRESENTERS Alphabetically, alphanumeric following name indicates number of presentation at Wailuku, Maui.

George Babson	M13
Clint Churchill, Pro Geothermal Alliance	M11
Scott Crawford	M10
Carl Freedman, Blue Ocean Preservation Society	M5
Jason Groode	M3
Mary Groode	M2
Tom Jezierny, President Maui Electric Company	M7
Buck Joiner,	M8
Mary Mincher	M14
Wayne Nishiki, Maui County Council	M9
George Purdy III, Ka Lahui, Hawai'i	M4
Hank Roberts	M6
Bob Schmidt	M12
Bill Smith (Process questions only, no presentation)	M1

PRESENTATIONS

1. PURPOSE OF PROJECT

In questioning the objectives of the HGP, commenters noted that planning for the development of 500 MW of geothermal power places substantial reliance on a single source of power with a high potential for failure either in power supply or cable. They also said, with respect to the State's stated goal of obtaining a renewable supply of energy, that geothermal is not proven to be a renewable resource (*e.g.* drawdown of the Geysers in California).

2. PROPOSED ACTION

2.1 Definition of Project

2.2 Resource Concerns

Commenters noted that geothermal is not proven to be a renewable resource.

2.3 Geothermal Project Reliability

Nearly a quarter of the commenters expressed concern about the reliability of the geothermal facilities, some noting that mistakes had been made in the past. Most were concerned with the impacts of natural events, and asked that the EIS investigate:

- the impacts of failure due to seismic or volcanic activity, including wells or towers being overrun by lava or damaged by earthquakes (also Section 5.7.5).

- the possibility that brine ponds might overflow during heavy rains or leak due to the corrosive nature, high temperature, and high pressure of the geothermal fluids. (also Section 5.3)

- the ability of the facility to withstand seismic events. Could seismic events cause cracks in production/reinjection wells (also Section 5.3)?

- the impact of loss of 500 MW to users. The EIS should also discuss the extent of backup power available on Oahu in case of a break in service.

Sufficient concern was expressed to make the failure mode seem part of the proposed action (Concerns to be addressed with respect to air and water quality, ecological resources, noise, health and safety, and economics,

Sections 5.2, 5.3, 5.4, 5.6, 5.7 and 5.9).

2.3.1 *Mitigation Methods*

One commenter asked how the government will assure that geothermal emissions and effluents do not impact on air, water and food quality and how the failure modes (mentioned Section 2.3) could be prevented or at least prevented from impacting the surrounding environment.

2.4 Cumulative Impacts of Prior and On-going Geothermal Development

2.5 Cable/Transmission Lines

The commenters want the EIS to define primary and alternative cable routes and to examine the impacts of geothermal energy brought to Maui via cable, citing the impacts of the pumping stations [to supply oil under pressure to the oil-filled cable] that will be on Maui where the cable lands and leaves the island.

Nearly 40% of the commenters questioned the reliability of the cable, asking if the submarine cable was feasible in view of the steepness, depth, bottom roughness and frequency of debris flows in the Alenuihaha channel. The EIS should address:

- impacts associated with cable failure if it were subjected to a seismic or volcanic event, for example.
- the implications of possible sabotage of the cable.
- whether shark bites will damage the cable should its operation attract them.

One commenter was concerned with reliability of transmission lines on land and asked that the EIS assess the impacts on Maui if high tension line towers fall or are damaged during an earthquake. The commenter noted that Maui is seismically active.

2.6 Future Uses

More than 30% of the presenters asked that the EIS address the impacts of reasonably foreseeable future uses of geothermal energy. These include:

- manganese nodule mining and refining on Hawaii. The commenter referred to a 1981 DBED/NOAA feasibility/environmental impact study on manganese-nodule processing for Puna which would require from

25-350 MW derived from geothermal sources.

- a proposed space port on Hawai'i. (The proposal refers to use of geothermal energy.)
- development that might occur should power become available on Maui.

3. ALTERNATIVES TO THE PROPOSED ACTION

More than 90% of the commenters requested that the EIS identify and assess the relative merits and impacts of energy alternatives to the proposed action. One commenter stated that nuclear energy is not a viable option for Hawaii. Another suggested that it is a possibility that by the time that the cable is laid that other technologies will make its need obsolete, such as electric vehicles (Section 3.4), solar technologies and use of non-narcotic hemp for biomass conversion (Section 3.1).

3.1 Conservation and Renewables

Nearly 80% requested that the EIS investigate conservation and renewable forms of energy, such as wind, solar, and biomass. They suggested integrated resource planning be used, noting that the State is initiating such a process (but may not be completed within the proposed time scale of the EIS). With respect to these energy options, the commenters suggested that:

- the wind resource for the Ulukalapua-Kaupo region, particularly at higher elevations, is excellent.
- the Kahikinui region has a good wind and solar resource.
- With respect to IRP, MECO will be participating in the State IRP process and EIS researchers should interface with that process.

The commenters requested that the EIS examine:

- the relative environmental, economic, and health and safety costs of geothermal *vs* alternative strategies.
- how much power demand could be reduced, if new conservation technologies are applied. The commenter noted that MECO has been promoting conservation and cited the new energy efficiency technologies (light bulbs *etc.*)
- the possibility of decentralization (off-grid) if energy independence is the objective of the HGP.

3.2 Geothermal Alternatives

More than 30% suggested geothermal alternatives, asking that the EIS:

- consider the impacts of geothermal development on Maui, if it is a reasonably foreseeable alternative, including the impacts of geothermal drilling in the Maui near Kahikinui, Makena or Ulupalakua. (Also a Land Use Issue, Section 5.1)

One commenter suggested that geothermal power might be feasible for the Big Island if it can be operated in an environmentally benign way.

3.3 Alternatives to the Cable/Transmission Lines

Alternatives to transmission lines along the southeastern coast of Maui should be considered, including the following cable route: North Kohala to Lana'i with spur lines to Lahaina and Molokai and direct line from Lanai to Oahu.

The EIS should examine all the impacts of the "no action" alternative on Maui including air quality and aesthetics, particularly with reference to a cable route that goes primarily to Lana'i with a spur line to Lahaina.

3.4 Transportation

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5. POTENTIAL ENVIRONMENTAL ISSUES

Nearly 70% of the commenters made general statements concerning environmental costs and impacts. Many believe that the EIS should investigate the potential short- and long-term environmental costs of the HGP (particularly to pristine environments) from a planetary or global perspective. It was noted that:

- if the information necessary to assess the impacts of the HGP is not available, it should be obtained and made available to the public. However, the commenter noted that studies that would be intrusive should not be performed. Another commenter questioned how baseline studies would be performed, mentioning the need for experts in a number of fields, for example, whales, electronics, and cable technology.

Others were concerned about environmental costs to Maui, particularly the impacts on pristine environments, such as Ulupalakua, the south side of Maui and Hawaiian homestead lands (also Section 5.1, 5.10). The EIS should consider the environmental effects of a land-based cable route and landing the cable.

5.1 Competing Uses

The commenters concerned with land use asked that the EIS investigate the merits of using Native Hawaiian homelands and ceded lands for the HGP, even though some of those lands are not currently being developed because they have no supporting infrastructure. They say that the EIS should assess the land use issues that arise if:

- the cable route passes through Hawaiian homelands or ceded lands, even though those lands may not be considered homesteadable at present because they lack supporting infrastructure. The lands between Ulupalakua and Kaupo (also Sections 5.4.3 and 5.9.4) were mentioned particularly.

- if drilling for geothermal power should occur in Maui near Kahikinui, Makena or Ulupalakua [which is near a designated conservation district (Ahihi Kinau)].

The commenters were also concerned about the implications of the Campbell estate land trade on the Big Island that enable geothermal development in Wao Kele o Puna rainforest.

5.2 Air Quality Concerns

The presenters recommended that the EIS characterize the emissions associated with the 500 MW development, including As, Hg, Pb, B, Cd, Mn and other toxics, and identify the impacts of those emissions [also a water quality issue (Section 5.3) as in the Puna district many residents use water catchments].

5.3 Water Quality Issues

The EIS should also characterize the effluents and the brine ponds associated with the 500 MW development, including As, Hg, Pb, B, Cd, Mn and other toxics. The EIS should report the impacts of those effluents under normal operating conditions and also the impacts of:

- leakage of source and injection wells into aquifers due to well failure.
- the brine ponds, particularly if they leak or overflow (also Section 2.3).

5.4 Ecological Resources

5.4.1 *Impacts on Terrestrial and Land-based Aquatic Ecosystems*

The EIS should assess the impacts of the HGP on game used for subsistence living on the southeast end of Maui.

5.4.2 *Rain Forest Issues.*

The EIS should consider the impact of loss of plants of medicinal and ritual use to Native Hawaiians on Maui and on the medicinal plants and animal species found in the Wao Kele o Puna rain forest (also Sections 5.4.3 and 5.9.4).

5.4.3 *Threatened, endangered, or endemic species concerns*

The EIS should examine impacts of the submarine cable on endangered sea turtles and humpback whales (particularly nursing mothers and their offspring) [Ref. the jet ski court case to understand the background of whale controversy in Maui]. The EIS should investigate the impacts of

- the cable on humpback whale migration patterns, birth rate, and ability to navigate and locate.
- nets (used to protect swimmers if the submarine cable attracts sharks) on humpback whales' birthing habits in shallow, protected waters.

Others said that the EIS should examine the impacts of the HGP on threatened and endangered plants in the lands between Ulupalakua and Kaupo (also Sections 5.1 and 5.9.4).

5.4.4 *Marine Concerns*

The EIS should investigate the impacts of the submarine cable installation, normal operation (emf effects), and in failure modes (such as oil leakage) on:

- sea turtles, big game fish, dolphins, food stocks, and sharks. [Also has implications for Section 2.5 (Cable reliability), 5.7 (Health and Safety) and 5.9.1 (Economics).]
- on reefs and ocean ecology in the coastal zone where the submarine cable lands.

5.5 Geological Issues

The EIS should address the concern that drilling and reinjection could cause seismic events.

5.6 Aesthetic Issues

5.6.1 *Noise*

5.6.2 *Visual Issues*

Commenters expressed concern about the aesthetic costs of the HGP, particularly, the impacts of:

- an overland transmission line on Maui (also Section 5.9.1).
- clearing the Wao Kele o Puna rainforest.

5.6.3 *Odor Issues*

5.7 Health and Safety Issues

The EIS should examine the health and safety aspects of the HGP.

5.7.1 *Geothermal Emissions and Effluents*

5.7.2 *Transmission Line Effects*

The EIS should examine the health and safety impacts of the transmission line/underwater cable system, particularly the effects of electromagnetic fields, along the transmission line corridor.

5.7.3 *Noise*

5.7.4 *Psychological Impacts*

5.7.5 *Safety, Civil Defense Issues*

If the submarine cable attracts sharks (Section 5.4.4), what threat do they pose to swimmers? What steps will be taken to protect swimmers? (Also Section 5.9.1, Economic Issues).

The EIS should consider the implications of possible sabotage of the cable (also Section 2.5).

5.8 Political Issues

About 50% of the commenters had political concerns, noting their frustration. They mentioned loss of trust in government, loss of individual rights.

5.9 Socioeconomic Issues

5.9.1 *Economic Issues*

Nearly 50% of the commenters had economic concerns. They asked that the EIS examine the economic costs of the entire HGP project to users and non-users, and taxpayers, including all State developmental costs and costs for publicity *etc*. It should:

- assure that the information to make rational decisions is presented for the public to review. (The commenter suggested that geothermal developers may have some data.)
- examine the cost-effectiveness of the project and clearly delineate the environmental costs. [MECO would consider using geothermal power if it were cost effective (and environmentally benign).]

The EIS should address the economic impacts should the submarine cable affect:

- big game fish and food stocks.
- tourism. For example, if the submarine cable attracts sharks, what will it cost to protect swimmers and who will bear the costs?

5.9.2 *Life Style*

The EIS should address impacts of the HGP on the life styles of the general population, specifically on Native Hawaiians. They ask if the cable/transmission lines will affect, for instance, subsistence life styles or the ability to access beaches (also Section 5.10).

5.9.3 *Social Issues*

The EIS should examine the social costs of the entire HGP project.

5.9.4 *Native Hawaiian Issues*

More than half the commenters were concerned about the potential impacts of the HGP to cultural resources.

The EIS should respect and address Native Hawaiian religious and cultural concerns. The commenters asked that the EIS examine potential impacts:

- to native Hawaiian culture, particularly the lands between Ulupalakua and Kaupo (also Land Use and Threatened, Endangered and Endemic Issues, Sections 5.1 and 5.4.3).
- of loss of plants of medicinal and ritual use to Native Hawaiians.
- if the cable route traverses Hawaiian homelands or ceded lands (also Section 5.1), noting that Native Hawaiians have a right and spiritual need to be able to return to their homelands and live their chosen life style (also Section 5.9.2).
- on Native Hawaiian subsistence hunting, fishing, and gathering.

5.9.5 *Impacts to Cultural Resources (Archeological/Historical Sites and Regions*

The commenters asked that the EIS assess potential impacts to the many important, and often undocumented, archeological sites on the south coast of Maui (also Section 5.1, 5.5).

6. COST BENEFIT ANALYSIS

Commenters asked should Maui have to bear the costs of development to provide power for Oahu.

7. LEGAL ISSUES

ATTACHMENT A

FACILITATOR PRESENTATION

HAWAII SCOPING MEETINGS

March 7, 1992, Pahoa, Hawai'i
March 9, 1992, Wailuku, Maui
March 12, 1992, Kaunakakai, Moloka'i
March 14, 1992, Honolulu, Oahu
March 16, 1992, Waimea, Hawai'i

Summary of Presentation

Introduction: Mr. Spiegel first introduced himself and Ms. Letts, from West Hawai'i Mediation Services and the Center for Alternative Dispute Resolution, respectively, as professional facilitators. He explained that they were hired to run a fair and impartial scoping meeting. He then introduced Dr. Lewis [Hawai'i Geothermal Project (HGP) Environmental Impact Statement (EIS) Program Director from DOE Headquarters], Carol Borgstrom, Director of the Office of National Environmental Policy Act Oversight, DOE Headquarters], and William Dennison [Assistant General Counsel for the Environment, DOE Headquarters]. The facilitator then stated that his purpose was to remain neutral and keep the meeting on track.

Structure of Meeting: The attendees were advised as follows. The intent of the meeting was to identify issues and concerns that those present had concerning the HGP. The facilitators will do their best to assure that everyone gets to be heard. Only questions with regard to process will be answered. In order to assure this, those who wish to speak will give their presentation in the order that they have registered; individuals will have 5 minutes and organizations and elected officials will have 10 minutes. Speakers are to identify themselves and the group they represent. Those who wish to speak should register; speakers may speak at only one of the planned scoping meetings; if anyone needs more time to finish, he/she may reregister, and time-permitting, will be given an additional 5/10 minutes, as appropriate. If a presentation is to be given in Hawaiian, an interpreter is available. If necessary, time will be extended as possible. In each meeting there will be a 10 minute break about half way through the meeting. Any written materials can be handed in at the meetings or sent to Dr. Lewis at DOE before 15 April 1992 to assure consideration. Each meeting will be recorded by a court reporter, and tape and video recorders to assure an accurate record of presentations. If requested, the video recorder can be turned off. Transcripts of the meetings will be available in 21 reading rooms in Hawai'i and on the mainland. Attendees were invited to have their names placed on the EIS mailing list (sign up at registration desk) to receive any future EIS-related notices.

Ground Rules: Facilitator requests that those present be courteous to each other, that they do not interrupt speakers, and stay within the designated time limits. Private conversations and interviews should be conducted outside the meeting room. Dr. Lewis is available for interviews prior to each meeting and at the breaks.

NEPA Background: The scoping meetings were shown to occur between the Notice of Intent (NOI) and the production of the Implementation Plan (IP). Following preparation of the EIS IP, a Draft EIS (DEIS) will be prepared. After public review of the DEIS, a FEIS will be available for public review. A total of ten scoping meetings would be held with two each day in Pahoa, Wailuku, Kaunakakai, Honolulu, and Waimea (afternoon, 2-5:30 PM and evening 7-10:30 PM).

Turns meeting over to Dr. Lewis for further comment.

ATTACHMENT B

DOE PROJECT/PROCESS DESCRIPTION

HAWAII SCOPING MEETINGS

March 7, 1992, Pahoa, Hawai'i
March 9, 1992, Wailuku, Maui
March 12, 1992, Kaunakakai, Moloka'i
March 14, 1992, Honolulu, Oahu
March 16, 1992, Waimea, Hawai'i

Summary of Presentation

Introduction: After introducing himself as the Program Director for the Hawaii Geothermal Project Environmental Impact Statement (HGP EIS), Dr. Lewis began his presentation by stating that DOE's mission is "to prepare an Environmental Impact Statement (EIS) for phases 3 and 4 of the Hawaii Geothermal Project (HGP) as defined by the State of Hawaii in its proposal to Congress in 1989," noting that the Proposed Action had been defined by Congress (3/91) and the US District Court in Hawaii (6/91). He then explained that phases 1 [exploration, HGP(A)] and 2 [test of the feasibility of laying and retrieving the submarine cable] were complete. He noted that they were funded by DOE, the State of Hawai'i, and others and had undergone NEPA review. He stated that although phases 1 and 2 had had environmental review, they form an important data base and would be reexamined from the perspective of cumulative impacts. He also noted that the EIS would examine a range of reasonably foreseeable alternatives, both within and outside geothermal.

He then acknowledged Carol Borgstrom, Director of the Office of National Environmental Policy Act Oversight, DOE Headquarters], noting that she was assisted by Dr. Yvonne Weber, and also William Dennison [Assistant General Counsel for the Environment, DOE Headquarters], recognizing his assistance by Janine Sweeney. He introduced the representatives from DOE-OR (Andrea Campbell); ORNL, assisting in the preparation of the EIS (Dr. Amy Wolfe, Dr. Virginia Tolbert), and LBL, cable and alternatives (Mary Hunt). The latter were also to assist in recording highlights of scoping meetings.

EIS Process: Dr. Lewis described the EIS process. Initially an Advance Notice of Intent was published; 55 letters and hundreds of comments were received in response. Next were information exchange meetings with various civic, environmental, and Native Hawaiian groups, utilities, museums, developers, and potential cooperating agencies, including several federal, State, and County departments. At these meetings, concerns and issues were raised. He noted that several agencies would probably elect cooperating agency status. Cooperating agencies can include federal agencies, States, county governments and Native American Nations. These meetings were followed by a Notice of Intent announcing scoping meetings.

On Maui information exchange meetings included: Maui County officials, Blue Ocean Preservation Society, Campbell Estate, Coral Reef Foundation, Kaupo Ranch, Maui Tomorrow, Pele Defense Fund and Sierra Club. Dr. Lewis then turned the meeting over to the Facilitator for process questions.

SCOPING MEETING SUMMARY
Wailuku, Maui, 9 March 1992, 7PM

Mary S. Quinby-Hunt
1 June 1992

OVERVIEW

The meeting began with presentations by the facilitator, Ms. Letts, and Dr. Lewis, the program director from DOE. The facilitator introduced those on the podium. He then described the general structure of the meeting and its purpose: to hear the issues and concerns of those present regarding the proposed Hawaiian Geothermal Project. He described his role as assuring the impartiality and fairness of the meeting. Dr. Lewis further defined the scope of the project, introduced members of the EIS team, and briefly described the EIS process. About 40% of those presenting asked process questions about the proposed action, federal involvement in the geothermal development and EIS procedures.

Seventy-five percent of those presenting were concerned about the impacts of the HGP on cultural resources. More than 50% were concerned with potential impacts on Native Hawaiian rights, religion, culture, and lifestyle, including subsistence living. Other commenters (~45%) were concerned that construction of the submarine cable/tranmission lines and their associated infrastructure (pumping stations, roads, substations) would negatively impact archeological and historical sites and regions, particularly along the southeast coast of Maui (Kipahulu to Makena), many of which have not been adequately documented, analyzed, or evaluated because the area is undeveloped.

More than 60% of the presenters expressed general concern for the pristine environments that might be impacted by the HGP (*e.g.*, wells, support structures, transmission lines, pumping stations, campsites, access roads, and aircraft used for maintenance reconnaissance). About 20% of those commenting wanted the EIS to consider long- and short term impacts and costs of the HGP on the southeast coast of Maui and the Hana District and others want the EIS to address the world-wide implications of the HGP, for example, loss of the rainforest's ability to consume CO_2 and generate O_2.

Nearly 60% of those commenting expressed health and safety concerns that would result from geothermal development, operations, and the transmission system. About 30% were concerned with health and safety issues associated with the geothermal development in Puna, but noted that under the right atmospheric conditions emissions from Puna can reach Maui. Others voiced concern over noise, smells, visual affects and psychological impacts. Some commenters were concerned about the impacts of the HGP on lifestyles, particularly those on the southeast coast of Maui and in Hana District. Still others were concerned about electromagnetic fields produced by the submarine cable/overland transmission lines, and the safety of laying and maintaining the cable

in the extreme oceanographic conditions that prevail in the Alenuihaha Channel.

More than 50% of the presenters asked that the EIS examine the project's impact on Hawai'i's unique terrestrial, marine and other ecosystems, including their threatened, endangered, and endemic plants, vertebrates, and invertebrates, some of which have medicinal or ritual use. The EIS should include the effects of drilling wells, clearing roads, constructing buildings, and associated emissions on the rainforest or dry forests of Maui, the importance of introducing exotic species via new roads, and extensive segmentation. [Several consultants were suggested by the presenters.] The EIS should investigate the impacts of the HGP on humpback whales and other endangered marine species and on insects found in lava tubes. Twenty-five percent of the commenters requested that the EIS should address the effects of the HGP on the ocean and its resources, including the impacts on the marine environment due to oil-release from the cable, the effect of increased turbidity, and the impacts of cable emf and stray voltage on marine mammals and pelagic fish. One commenter suggested that the EIS assess the problem of making a complex environmental decision without sufficient information to evaluate risks.

Approximately 50% of those commenting expressed economic concerns about the cost-effectiveness of the project, asking that the EIS consider all costs including those paid by government in direct funding and for regulatory and health personnel. A commenter questioned the impacts of diverting funds from conservation technologies, noting that investment in conservation technologies has resulted in changing patterns of investment toward technologies that reduce the need for energy consumption. Commenters also asked about impacts to local fisheries and other uses of marine resources and on agriculture. About 50% asked that the EIS to state the benefits of the HGP, *i.e.* who profits, and who pays the economic, environmental, social and other costs.

Half of the commenters asked that the EIS identify and assess the potential impacts of alternatives to the HGP that are cost effective, viable, and safe, including fossil fuel options (coal gasification), conservation and renewables (including solar, wind, biomass, and OTEC), and various geothermal options (including staged development and geothermal on Maui). They want the EIS to examine the relative economics of the HGP and the alternatives. One commenter suggested cable alternatives, such as the use of a solid rather than oil-filled cable (to elimate oil-pumping stations), AC rather than DC transmission (to eliminate power conversion stations), and a cable route that goes directly to Oahu.

More than 40% of the presenters expressed land use concerns. These include the propriety of geothermal development in the residential neighborhoods of Puna, noting that blowouts have occurred at most geothermal installations world-wide; and the propriety of using Native Hawaiian homelands and ceded lands both on Hawaii and on Maui for the HGP.

Roughly 40% of the presenters expressed lack of trust and faith in government, sensed a lack of concern by government, and criticized government's role in providing information regarding the HGP those potentially affected by it. One commenter asked about whether the U.S would lose international credibility if it permits cutting of a U.S. rainforest, while simultaneously asking other nations to stop cutting theirs.

Other issues were raised. Some commenters questioned the probability that the HGP would help meet the State's stated goal of rendering Hawai'i more energy self-sufficient and less dependent on fossil fuels. The description of the proposed action should include all aspects of the project including wells, lines, campsites, access roads, transmission lines, submarine cable, and aircraft used for surveillance. The EIS should estimate the number of wells and amount of land necessary, and describe abatement and land-rehabilitation techniques.

More than 30% of the presenters expressed concerns regarding the magnitude and renewability of the geothermal resource. A quarter of the presenters asked about the reliability of the geothermal operations. They suggest that the geothermal facility is vulnerable to blowouts, volcanic eruptions and intrusions, and earthquakes in addition to normal plant outages, and the EIS should identify and assess the impacts these factors will have on the HGP at inception and after 20 years. The EIS should examine the prior and on-going geothermal developments in the Puna District both as a useful data base and from the perspective of cumulative impacts. However, the commenters caution that earlier phases of the HGP should be reexamined. Other commenters asked that the EIS address the issues of induced seismicity and subsidence.

Nearly 20% of the commenters questioned the reliability and feasibility of operating and maintaining the submarine cable and the transmission lines, noting that phase 2 did not demonstrate a full-scale prototype installation nor was operation of such a cable demonstrated, in view of the possible disruptions by high winds, currents, tsunamis, debris flows, and seismic events, particularly in the Alenuihaha Channel. The EIS should consider impacts of transmission line failure, noting the need for 6-months standby power (*i.e.* the amount of time estimated to repair the cable).

More than 30% of the commenters expressed concern about the possible end-uses of geothermal power. The EIS should identify and assess the impacts (including cultural) of reasonably foreseeable future uses of the HGP, such as seabed minerals mining and refining, industrialization, development (*e.g.* hotels, golf courses), population increases, and the proposed space port. The EIS should address also the idea that increased power availability will cause increased consumption, industrialization, development and population increase, *etc.*

A number of studies of the affected environment were suggested, including characterization of the hydrology of

the Kilauea East Rift Zone, documentation and analysis of the archeological sites on the southeastern coast of Maui, and characterization of geothermal fluids and solid wastes.

With respect to air quality, the EIS should examine the issue of thermal pollution due to releases of geothermal heat and the impacts on Maui of geothermal emissions. Water quality issues raised by 25% of those presenting were potential impacts of the HGP on drinking water quality, on surface or ground waters, considering the effect of deep or shallow reinjection and its impacts, abatement technologies, and mixing geothermal fluids with aquifers of the Kilauea East Rift Zone. One commenter asked about the impacts of changing the water quality designation of aquifers in the geothermal subzone.

MEETING SUMMARY

Letts Presentation - Attachment A

DOE Project/Process Description - Attachment B

Process Discussions.

Federal Involvement in Geothermal Development and HGP-EIS. When asked why the federal government is doing the EIS when the project is State and privately funded, Dr. Lewis responded that while the U.S. Congress does not feel that the HGP is a federal project; they have stated that, because of the complex and unique environmental issues to be addressed, it is in the best interests of all concerned that the federal government prepare the EIS. The U.S. District Court in Hawai'i said that the HGP is a federal project, that the federal government must prepare an EIS, and that the federal government is prohibited from otherwise supporting the HGP.

At present the Record of Decision under consideration by DOE will determine whether to partially fund phase 3 of the State of Hawaii proposal to Congress. The total appropriation in hand is $5M, all of which has been redirected to the EIS project. No other funds are being expended on HGP. The ROD will decide whether the remainder of the $5M will be directed to the State for the HGP. If the EIS costs more than $5M, DOE will probably apply for additional funds to complete the project.

With respect to federal involvement in the project to date, Dr. Lewis estimated that DOE had spent about $11M for HGP(A) and about $25M for the cable demonstration, or ~$36M total. He noted that in addition, DOE had funded some projects at the University of Hawai'i, and some environmental projects, so that the total federal contribution was probably between $35M and $40M.

Public Access to Information. The DOE and the EIS should make information concerning the HGP readily available to the public to facilitate their making reasoned decisions about the HGP.

NOI Clarification re: Proposed Action. One person further noted that the NOI referred to 500 kV DC transmission cable; he believes that 300 kV DC is the correct figure. Dr. Lewis clarified that, although the resource for geothermal development has not been verified on Hawai'i, the U.S. District Court decision states that the EIS must examine the HGP as defined in the State's 1989 proposal to Congress. He noted that to transmit 500 MW to Oahu, a larger amount (possibly 600 MW as suggested in a scoping meeting in Pahoa) might be required on Hawai'i, and that the 300 kV DC figure that the commenter referred to was the accurate one, not the 500 kV DC figure in the NOI. Regarding geothermal development on Maui for electricity

production, due to the probable lower temperature resource, Dr. Lewis agreed that it does not seem reasonably foreseeable with respect to the electricity production needs of the HGP (this needs to be clarified based on the State geothermal resource zone designation for Maui). Dr. Lewis clarified that any impoundments associated with the HGP would likely be for facility operation, not for waste disposal. Impoundments are not a viable long-term alternative for waste disposal; reinjection is the preferred mechanism.

Alternatives. Dr. Lewis explained that those preparing the EIS must examine all alternatives to the proposed action that are reasonably foreseeable and stated that the EIS would be investigating the potential of demand-side management via an IRP process. He noted that an examination of the alternatives available would be conducted on an island-by-island basis.

Cumulative Effects. With respect to prior geothermal activities, Dr. Lewis responded that DOE was challenged to reconsider all prior data and evidence including that obtained for prior geothermal activities, from the perspective of cumulative impacts.

EIS Preparation/Necessary Studies. One commenter asked how much control DOE has over the preparation of the EIS and requested that the EIS assure that the necessary studies are performed by qualified, unbiased experts. Dr. Lewis responded that DOE asks for recommendations regarding those experts and consultants to use, but DOE makes the decision. DOE and its national laboratory contractors are bound by the same procurement and competition regulations. He asked for suggestions of qualified experts to conduct necessary studies.

With respect to the need for long-term studies, Dr. Lewis stated that although such studies would be beneficial, an EIS does not provide the mechanism to perform them. The preparers are required to use the best available information and studies that can be performed in a reasonable amount of time for a reasonable cost. He gave the example that a baseline, endangered species quantification might be conducted, if such data is unavailable. Ms. Borgstrom further explained with respect to incomplete and unavailable information, that it is incumbent upon DOE to acknowledge the limitation of the knowledge and the significance of what is lacking.

Section 7 Consultations. With respect to a "taking" issue, Section 7 Endangered Species Act consultation, Ms. Borgstrom stated that DOE is required to comply with the Endangered Species Act and would be engaged in the Section 7 consultation with the U.S. Fish and Wildlife Service, if that were required. Ms. Borgstrom further stated that there could be an assessment of potential risk of "taking" in a discussion in the endangered species analysis.

Risk Analysis. Dr. Lewis stated that there would be a chapter in the EIS covering the risk of credible accidents, risks to the human environment, and risk in association with safety questions.

Additional Scoping/Information Exchange Meetings. A commenter requested that DOE hold hearings in Hana as travelling to Wailuku is not possible for many who live in that district. Others suggested that DOE should speak with the kupuna, elders, and religious leaders to learn the issues and concerns of Native Hawaiians. Dr. Lewis indicated that, to the extent practical, the EIS team would interact with Native Hawaiian organizations on an equivalent cooperating agency basis. Dr. Lewis stated that the EIS team would be visiting the southeast coast of Maui on the next day and would welcome suggestions of locations, communities, individuals or groups that they should see. He stated that DOE will make a good faith effort, both by the letter of the law and its intent, on the EIS and requested that those present should read the implementation plan and other documents in the reading rooms and comment to DOE.

PRESENTERS Alphabetically, alphanumeric following name indicates number of presentation at Wailuku, Maui.

Margo Berdeshevsky	M30
Kiani Kaumuali'i Crabbe, Maui Liason, Pele Defense Fund	M24
Robin Crabbe	M21
Dr. Fern P. Duvall II, Terrestrial Biologist for State of Hawaii	M25
V. Lee Fuqua	M17
Judy Kinzer, Kipahulu Community Association	M18
Leslie Kuloloio	M29
Al Lagunero	M27
Charles Maxwell, Member State Advisory Committee to US Civil Rights Commission	M19
William Merwin	M22
Paula D. Merwin	M23
Steven Moser, MD	M28
Glen K. Nanod	M20
Ben Pittenger	M26
Bill Smith (Process questions only, no presentation)	M1'
James Williamson, Maui Energy Alliance	M15
David Werthman	M16

PRESENTATIONS

1. PURPOSE OF PROJECT

Commenters questioned the probability that the HGP would achieve the State's stated goal of rendering Hawai'i more energy self-sufficient and less dependent on fossil fuels.

2. PROPOSED ACTION

2.1 Definition of Project

The EIS description of the proposed action include all aspects of the project including wells, lines, campsites, access roads, [transmission lines, submarine cable], and aircraft used for surveillance. The EIS should:

- delineate the area that will be required for construction of the HGP, particularly for those facilities that will require clearing of the rainforest.

- estimate the actual number of wells and the extent of the installation required to produce 500 MW, but notes that only 450 MW will reach Oahu. One commenter noted that in most locations currently using geothermal power a significant number of wells drilled are not productive for either production or reinjection.

    - Examples: Iceland (1/2 the wells drilled not operating in 1989), Japan (2/5 wells producing at Otake), Italy (190/511 wells producing), and El Salvador (10/28 wells producing). In the Philippines and Mexico many more wells were drilled than actually produced.

- When examining other geothermal developments as possible models, one commenter noted that Krafla, Iceland, may be a good point of comparison as it is both seismically and volcanically active. In contrast, he noted that the less seismically and volcanically active geothermal developments on the mainland U.S. may not be appropriate prototypes for comparison.

- One commenter noted that he hoped that the proposed action includes reinjection, rather than impoundments, referring to the prior experience with HGP(A) impoundments also Sections 2.3.1 and 2.4)

2.2 Resource Concerns

More than 30% of the presenters expressed concerns regarding the geothermal resource. They were concerned:

- that the magnitude of the resource in the Kilauea East Rift Zone has not been verified.
- that the geothermal resource is not proven to be renewable. [Ref. *Science* article].
- about what happens after the resource is depleted, if the project area will be expanded and new wells drilled (also Section 2.1).

2.3 Geothermal Project Reliability

A quarter of the presenters asked about the reliability of the geothermal operations. The EIS should:

- identify and assess potential impacts of failure modes. They suggest that the geothermal facility is vulnerable to blowouts, volcanic eruptions and earthquakes in addition to normal plant outages. One commenter noted that blowouts have occurred at most geothermal installations world-wide.

- address the problem with uncontrollable blowouts noting the as yet uncontrolled blowout at the Geysers in California that began in 1957.

- potential problems caused by lava intrusions (ref. the problems in Krafla, Iceland) or sea water intrusion into wells or subsidence.

- address the possibility of lava overflowing wells.

- examine the proposed geothermal methods taking into account the unique geological system with which it will interact [Commenters noted the systems on Hawaii, but also in the Maui-Kahoolawe-Molokini region, Section 3.2]. Specifically, the EIS should:

    - examine the potential for seismic/volcanic events interconnecting aquifers resulting in contamination.
    - address the possibility of outside leakage during normal operation or during venting, at initiation and after twenty years and what the impacts of such leakage are (also Sections 3.2, 5.2, and 5.7.1)

2.3.1 *Mitigation Methods*

The EIS should identify and assess the potential impacts from the proposed and alternative abatement

technologies associated with geothermal power generation.

- The commenter noted that sodium hydroxide (NaOH) would be used in a 4:1 ratio to abate H_2S, which he said would result in a large amount of material requiring disposal. He asked how the byproducts would be disposed, and what the impacts of proper and improper disposal would be (also pertinent to Section 5.3 Water Quality Issues and 5.7 Health and Safety Issues).

- The EIS should examine the potential for deep or shallow reinjection and its impacts.

  - Based on an understanding the hydrology of the Kilauea East Rift Zone, the impacts of reinjection should be understood and assessed (also Sections 4, Affected Environment, and Section 5.3, Water Quality), considering the possibility of interconnecting aquifers due to seismic or volcanic events (also Section 2.3).

The EIS should consider how to restore the land (*i.e.* reforest, restock with biota *etc.*) used by the HGP, if the resource is depleted or when the HGP (or parts of it) are decommissioned. The EIS should identify who will do the restoration and who will assure that it is done. Will the structures be removed?

2.4 Cumulative Impacts of Prior and On-going Geothermal Development

The EIS should examine the prior and on-going geothermal developments in the Puna District both as a useful data base and from the perspective of cumulative impacts. The commenters noted that:

- that impoundments associated with HGP(A) were slimy. They asked whether they contained As, Hg, or B.

- the EIS should examine the KS8 blowout, [its causes], and short- and long-term effects, to understand its contributions to cumulative impacts and to extrapolate to potential future impacts.

- examination of the HGP(A) output might be potentially important for establishing the magnitude of the resource.

However, the commenters caution that:

- the results of phases 1 and 2 of the HGP project should be re-examined. DOE should examine prior experiences with geothermal development in Hawai'i and elsewhere.

- a 200-fold extrapolation from one well to the HGP is not sensible.

2.5 Cable/Transmission Lines

Nearly 20% of the commenters questioned the reliability and feasibility of operating and maintaining the submarine cable and the transmission lines. The EIS should examine:

- the technical feasibility of the cable and reliability over the long term, both in terms of reliability in placement and operation. The commenters:

  - noted that phase 2 only demonstrated the feasibility of laying the cable and retrieving it; it did not demonstrate a full-scale prototype installation taking into account the length and depth required nor was operation of such a cable demonstrated.

  - expressed concern regarding the feasibility and reliability of cable installation and maintenance, particularly the shoreline connections, in view of the possible disruptions by high winds, currents, tsunamis, debris flows, seismic events, and ship anchors, particularly in the Alenuihaha Channel.

- impacts of transmission line failure, noting that HECO estimates that the down time for repair is 6 months thereby requiring that standby generation for 500 MW would be necessary on Oahu. It was suggested that this standby power would probably operate on oil power and require storage facilities for at least 6 months of operation.

- the impacts due to failure of an oil-filled cable or electrical faults.

2.6 Future Uses

More than 30% of the commenters expressed concern about the possible end-uses of geothermal power. The EIS should identify and assess the impacts (including cultural) of reasonably foreseeable future uses of the HGP such as:

- seabed minerals mining and refining,
- industrialization, development (*e.g.* hotels, golf courses), and population increases,
- the proposed space port at South Point.

The EIS should address also the idea that increased power availability will cause increase consumption, industrialization, development and population increase, *etc.*

3. ALTERNATIVES TO THE PROPOSED ACTION

Half of the commenters asked that the EIS identify and assess the potential impacts of alternatives to the HGP that are cost effective, viable, and safe, including fossil fuel options (coal gasification), conservation and renewables, and various geothermal options. They want the EIS to examine the relative economics of the HGP and the alternatives. The commenter believes that this should be a major concern of the EIS (also Section 5.9.1)

3.1 Conservation and Renewables

Nearly 40% of the commenters requested that the EIS examine conservation and renewable energy options as alternative to the HGP. They suggested solar, wind, biomass, conservation, OTEC, off-grid options, or peak shaving (for example by means of off-peak water pumping). Commenters noted:

- the success of off-grid systems in Maui.
- that the Kaupo-Kipahulu side of Maui (southeastern coast) has a good solar and wind resource.

3.2 Geothermal Alternatives

With respect to geothermal alternatives, commenters want the EIS to assess

- a staged development of HGP so that experience is gained with the least capital costs.

- the possibility of closed-cycle geothermal using immediate reinjection.

- geothermal development on Maui, although one commenter believes that geothermal on Maui development is not a reasonably-foreseeable alternative. Of concern were air quality issues (Section 5.2) and land-use

concerns (Section 5.1) as the Maui designated geothermal subzone is near Ulupalakua (a conservation district and near Hawaiian homelands).

3.3 Alternatives to the Cable/Transmission Lines

One commenter raised a number of possible alternatives to the cable described in the NOI:

- solid rather than oil-filled cables.
- regarding the use of high voltage DC transmission, the commenter believes that only high voltage AC will be cost effective.
- possibility of routing the cable directly to Oahu, not landing on Maui.

3.4 Transportation

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

A number of studies of the affected environment were suggested, including:

- Characterization of the hydrology of the Kilauea East Rift Zone.
- Appropriate documentation and analysis of the archeological sites on the southeastern coast of Maui. [Ref. NEPA, National Historical Preservation Act, Section 7]. The commenter stated that DOE should use qualified experts to perform the studies.
- Characterization of geothermal fluids and solid wastes that would be associated with HGP (also PGV; True/Mid-Pacific), including such constituents as As, Hg, and U.

5. POTENTIAL ENVIRONMENTAL ISSUES

More than 60% of the presenters expressed general concern for the pristine environments that might be impacted by the HGP (including wells, support structures, transmission lines, pumping stations, campsites, access roads, and aircraft used for maintenance reconnaissance). They want the EIS to consider long- and short term impacts and costs of the HGP on:

- the southeast coast of Maui and the Hana District (particularly but not exclusively).
- on the world ecosystem, which is fragile, including the world-wide implications of the HGP, for example

loss of the rainforest's ability to consume CO_2 and produce O_2. [About 20% of those presenting mentioned this issue.]

5.1 Competing Uses

Greater than 40% of the commenters presented land use issues. The EIS should address:

- geothermal development in the residential neighborhoods of Puna, noting that blowouts occurred at most geothermal installations world-wide. The commenter noted a blowout in El Salvador that had fatal consequences.

- the propriety of using Native Hawaiian homelands and ceded lands for the HGP both on Hawaii and on Maui (also Section 5.9.4). On Maui the HGP could impact Ulupalakua which is designated a conservation district and also near Hawaiian homelands (from Section 3.2, Geothermal Alternatives).

5.2 Air Quality Concerns

The EIS should examine:

- the impacts associated with boron.
- the impacts of the solid wastes that would be associated with HGP (also those at PGV and True/Mid-Pacific) on air quality (also Section 5.3).
- the issue of thermal pollution due to releases of geothermal heat. This issue should also investigate the issue with respect to the problems of global warming (also Section 5.3).
- the impacts on Maui of geothermal emissions (also Sections 5.6.3 and 5.7.1) as a result of unabated venting from the geothermal development on Hawai'i (particularly when there is an inversion layer) or of geothermal development on Maui (Section 3.2). The commenter noted that under the right atmospheric conditions (Kona winds) volcanic emissions from Hawai'i affect the air quality on Maui.

5.3 Water Quality Issues

A quarter of the commenters expressed concerns about water quality issues. The EIS should address impacts of the HGP:

- on drinking water quality.
- on surface or ground waters,
  - recalling Hawai'i regulations allow reinjection of fluid wastes as close as ¼ mi from a domestic water source.
  - considering the effect of deep or shallow reinjection and its impacts.
  - considering possible contact with HGP-related solid wastes.
  - due to abatement technologies (including H_2S abatement with NaOH and deep or shallow reinjection and possible failures of any abatement procedures)
  - due to mixing of geothermal fluids with aquifers of the Kilauea East Rift Zone (ref. to constituents such as B, As, Hg, and U [also applicable to Section 2.3.1, Mitigation Methods and Section 5.7, Health and Safety].

- of changing the water quality designation of aquifers in the geothermal subzone.

  - A commenter reported that a consulting company, Thermal Power, had reported that some wells used for reinjection contained constituents associated with geothermal fluids. Thermal Power recommended that the State DOH change the limit for these constituents (the injection-control lines, these limits set the limits for constituent levels in drinking water). Apparently, Thermal Power suggested that the line be redrawn such that the waters in the geothermal subzone in Puna would no longer be considered potable and subject to those rules and regulations.

- of brine ponds.

5.4 Ecological Resources

5.4.1 *Impacts on Terrestrial and Land-based Aquatic Ecosystems*

Nearly 40% of the commenters asked that the EIS examine the impacts of the HGP and its alternatives on terrestrial ecosystems, including:

- impacts of the transmission lines through and pumping stations in pristine environments, particularly the dry forest and southeastern coast of Maui.
- impacts on medicinal plants and herbs (also Sections 5.4.2, 5.4.3, 5.7, and 5.9.4). The EIS should also address the impacts of the loss of benefits of these plants, if impacted (also Sections 5.4.2, 5.4.3, 5.7 and

5.9.4). The commenter mentioned the need for practitioners to be able to obtain certain herbs found at higher elevations near the geothermal subzone.

- the chronic effects of high- and low-level emissions and effluents of geothermal on plants and animals, both in the wild and on agricultural lands (also Section 5.9.1)
- impacts to unique species, for example insects, that live in lava tubes.

5.4.2 *Rain Forest Issues*

One quarter of the presenters asked that the EIS examine the project's impact on the unique ecosystems that make up Hawaii including plants, vertebrates, and invertebrates. The speaker expressed concern that only about 10% of Hawai'i's original rainforests remain and only about 10% of that is considered pristine. The EIS should include the effects of:

- drilling wells, clearing roads, constructing buildings, and the emissions these activities create on the rain forest.
- exotic species being introduced into the rain forest facilitated by the new roads that have been and will be constructed to support geothermal development.
- extensive segmentation caused by roads built and areas cleared for the HGP on the rainforest ecosystem in Puna which is currently sufficiently fragile, such that any disruption could cause extinctions. Hampton Carson (geneticist, entomologist), Dieter Mueller-Dombois (botanist), and Dallas Jackson (geologist, vulcanologist) were suggested as valuable consultants.

One commenter was concerned that the construction of the HGP would start a series of complex changes in the lowland rainforest ecosystem. He stated that the "long-term longitudinal study" necessary to understand this effect would be difficult to conduct for the EIS, making it equally difficult, if not impossible, to predict the consequences of those changes. Thus, the EIS should assess the risks of making a complex environmental decision without information regarding the impacts.

The EIS should also study the impacts of destroying the unique and fragile habitat of the Wao Kele o Puna rainforest.

The EIS should evaluate the loss of benefits of medicinal plants and herbs (also Sections 5.4.1, 5.4.3, 5.7, and 5.9.4).

5.4.3 *Threatened, endangered, or endemic species concerns*

Nearly 40% of the presenters were concerned about the potential impacts of the HGP on threatened, endangered, and endemic species. The EIS should address the potential impacts of the HGP:

- on the threatened, endangered, and endemic species and unique ecosystems that make up Hawaii including plants, vertebrates, [and invertebrates]. It was mentioned that 80% of the species once present in Hawai'i are now extinct and about 50% of the remaining species are endangered, that the ecosystem that supports the threatened, endangered, and endemic is fragile, and that any disruption (for example, segmentation or stress of competition with exotics) could cause extinctions. The speaker stated that he believed that if there were "take," even inadvertent, in a federally-funded project then the project would be stopped.
- due to destruction of habitat and pollution.
- on humpback whales an other endangered marine species.
- loss of medicinal species (also Sections 5.4.1, 5.4.2, 5.7, and 5.9.4).

One commenter asked what happens if species become extinct as a result of HGP.

The EIS should consider that, because of the unusual geology in Hawai'i (criss-crossing lava flows, all islands), very small areas of unique habitat exist that support the few remaining individuals of an endangered species.

5.4.4 *Marine Concerns*

Twenty-five percent of the commenters requested that the EIS should address the effects of the HGP on the ocean and its resources, including.

- the impacts on the marine environment due to release of oil from the cable.
- the effect of increased turbidity due to the HGP.
- the impacts of cable emf and stray voltage on marine mammals and pelagic fish.

5.5 Geological Issues

The EIS should address the problems of induced seismicity due to waste-brine injection (*cf*. Philippines and Iceland which experience seismic events of Richter 2-3, and Rocky Flats events which may have been as high as 5). The commenter noted that induced seismicity is worse with high pressure production and reinjection.

The EIS should examine the problem of geothermal associated subsidence. One commenter referred to geothermal related subsidence of up to 20 feet in New Zealand.

5.6 Aesthetic Issues

5.6.1 *Noise*

The EIS should investigate the impacts of chronic exposure to nuisance levels of noise (also potentially Section 5.7.4).

5.6.2 *Visual Issues*

The EIS should consider the aesthetic impacts of the high-tension line towers in otherwise undeveloped regions.

5.6.3 *Odor Issues*

The EIS should investigate the impacts of chronic exposure to nuisance levels of odor (also potentially Section 5.7.4).

- One commenter expressed concern that the people on Maui are not used to the continuous smell of volcanic emissions (also Sections 5.2 and 5.7.1). This problem could arise as a result of geothermal development on Maui, Section 3.2, or as a result of unabated venting from the geothermal development on Hawai'i.

5.7 Health and Safety Issues

More than 50% of those commenting expressed health and safety concerns due to effects of geothermal operations or those of the transmission lines. One issue not fitting the categories below refers to the loss of medicinal plants and herbs (also Sections 5.4.1, 5.4.2, 5.4.3, and 5.9.4).

5.7.1 *Geothermal Emissions and Effluents*

More than 30% of those presenting were concerned with health issues due to geothermal operations The EIS should examine:

- the health and safety issues associated with geothermal development in Puna (for example, due to exposure to H_2S, Hg, and B),
  - under normal operating conditions and with unscheduled venting; [Ref. a University of Hawai'i study on H_2S],
  - due to normal abatement procedures and under failure modes, and
  - the chronic and acute effects of emissions and effluents of geothermal.

The EIS should determine the possibility of health impacts on Maui due to geothermal emissions (also Sections 3.2, 5.6.3, and 5.7).

5.7.2 *Transmission Line Effects*

The EIS should identify and assess the health and safety impacts from the cable and transmission lines.

- The impacts of emf should be included.
- One presenter expressed the concern that laying and maintaining the cable in the Alenuihaha Channel involves risk, mentioning the high winds in the Channel.

5.7.3 *Noise*

The EIS should examine the health and safety issues associated with noise:

- at and near the geothermal facility under normal operating conditions and with unscheduled venting;
- also along transmission lines, at work camps, and due to aircraft (doing maintenance reconnaissance).

5.7.4 *Psychological Impacts*

Three psychological concerns were raised:

- the psychological impacts that HGP and its associated development and environmental impacts will have.
- the impacts of chronic exposure to nuisance levels of noise and odor (Also Section 5.6.1 and 5.6.3).
- the psychological impacts on persons whose lifestyle had been disrupted, particularly for purposes that are contrary to the beliefs of those affected.

5.7.5 *Safety, Civil Defense Issues*

An appropriate emergency response plan should be developed.

5.8 Political Issues

Nearly 40% of those commenting expressed political concerns noting a lack of trust in government, a lack of concern by government, lack of faith in government, and a lack of necessary expertise in government. They questioned the propriety of some rules and regulations and asked about lack of enforcement by government.

One commenter asked about whether the U.S. would lose international credibility if it permits cutting of its rainforests, while at the same asking other nations to save theirs.

5.9 Socioeconomic Issues

5.9.1 *Economic Issues*

At least one half of the presenters expressed economic concerns about the HGP. They want the EIS to

- investigate the cost effectiveness of this venture, including prior federal and State investments.

- consider the impacts of diverting funds that could be spent on conservation technologies to the geothermal effort. One commenter noted that investment in conservation has resulted in changing patterns of investment toward technologies that reduce the need for energy consumption. Investment in conservation technologies save the costs of constructing/updating additional generation/transmission facilities.

- The EIS should consider the costs of restoring the land after the HGP (or parts of it) is decommissioned.

The EIS should address the economic impacts of the HGP, including the effects of the HGP on:

- local fishing operations and uses of other marine economic resources,
- agriculture, and
- cost of the DOH staffing.

5.9.2 *Life Style*

More than 30% of those commenting stated that the EIS should address the concern that the HGP will affect to lifestyles on Maui, particularly those on the southeastern coast from Ulupalakua to the Hana District. Commenters mentioned Native Hawaiian lifestyles (see also Section 5.9.4), including subsistence hunting and gathering, and the lifestyles of those who prefer privacy, peace and quiet, or lower levels of population, technology, or development (*e.g.* off-grid living).

5.9.3 *Social Issues*

A number of commenters asked what the sociological impacts of the HGP will be to all Hawaiians. They asked whether the HGP will affect the social uses of marine resources.

5.9.4 Native Hawaiian Issues

Seventy-five percent of those presenting were concerned about the impacts of the HGP on cultural resources. Most, >50%, were concerned with potential impacts to Native Hawaiian rights, religion, culture, and lifestyle, including subsistence living. The EIS should:

- address and respect Native Hawaiian concerns regarding the impacts of the HGP with respect to sovereignty, culture, religion (ref. National Indian Religious Freedom Act, also Section 7), history, and rights. In detail, the EIS should consider impacts of the HGP or its alternatives on:

  - the ocean, heiaus, and natural phenomena, all considered sacred,
  - Native Hawaiian traditions of subsistence living [hunting, fishing and gathering],
  - Native Hawaiian homelands and ceded lands which have cultural and religious value (also Section 5.1), and
  - the ability of Native Hawaiian practitioners to obtain herbs necessary for medicinal use or rituals (also Sections 5.7 and 5.4.5).

    * The commenter mentioned the need for practitioners on Maui have access to higher elevations near the geothermal subzone for certain herbs.

Many speakers were concerned that the HGP will result in desecration of Native Hawaiian religious beliefs. The EIS should address Native Hawaiian concerns that:

- geothermal development will result in desecration of Pele.
- HGP construction will result in desecration of ancient or modern Hawaiian burials in lava tubes, including those that may currently have been submerged.
- ocean seabed mining will be sacrilege (one commenter).

5.9.5 *Impacts to Cultural Resources (Archeological/Historical Sites and Regions)*

Other speakers (~45%) were concerned with impacts to archeological and historical sites, particularly along the southeast coast of Maui. The EIS should address the concern that construction of the transmission lines along the south coast of Maui (Kipahulu to Makena) will result in the destruction of many important archeological, historical, and on-going cultural sites and regions many of which have not been adequately documented or analyzed as the area is still undeveloped.

- The EIS examination should include sites used for well locations, power generating and transmission facilities, and infrastructure, such as roads.
- One commenter believes the entire south coast should be an historic conservation district. Another mentioned the importance of Kahiki-nui, the site used for departure in canoes for Tahiti. Others mentioned Kaupo and Nu'u.

6. COST BENEFIT ANALYSIS

Fifty percent of the commenters asked the EIS to state what the benefits of the HGP are, who they profit and who pays the costs; and to weigh the potential benefits of the HGP against the environmental costs.

- They ask whether it is right to ask one or more groups to bear the majority of the environmental, health and safety, cultural *etc.* costs when they may not benefit from the project.

- They ask the EIS should weigh the cost of using Native Hawaiian homelands and ceded lands against what benefits and for whom.

7. LEGAL ISSUES

Commenters mentioned the importance of the:

- National Historical Preservation Act (Section 5.9.4),
- Native American Religious Freedom Act (Section 5.9.4), and
- Endangered Species Act, Section 7 consultation.

ATTACHMENT A

FACILITATOR PRESENTATION

HAWAII SCOPING MEETINGS

March 7, 1992, Pahoa, Hawai'i
March 9, 1992, Wailuku, Maui
March 12, 1992, Kaunakakai, Moloka'i
March 14, 1992, Honolulu, Oahu
March 16, 1992, Waimea, Hawai'i

Summary of Presentation

Introduction: Ms. Letts first introduced herself and Mr. Spiegel, from the Center for Alternative Dispute Resolution and West Hawai'i Mediation Services respectively, as professional facilitators. She explained that they were hired to run a fair and impartial scoping meeting. She then introduced Dr. Lewis [Hawai'i Geothermal Project (HGP) Environmental Impact Statement (EIS) Program Director from DOE Headquarters], Carol Borgstrom, Director of the Office of National Environmental Policy Act Oversight, DOE Headquarters], and William Dennison [Assistant General Counsel for the Environment, DOE Headquarters]. The facilitator then stated that her purpose was to remain neutral and keep the meeting on track.

Structure of Meeting: The attendees were advised as follows. The intent of the meeting was to identify issues and concerns that those present had concerning the HGP. The facilitators will do their best to assure that everyone has a fair and equal opportunity to be heard. In order to assure this, those who wish to speak will give their presentation in the order that they have registered; individuals will have 5 minutes and organizations and elected officials will have 10 minutes. Only questions with regard to process will be answered. Speakers are to identify themselves and the group they represent. Those who wish to speak should register; speakers may speak at only one of the planned scoping meetings; if anyone needs more time to finish, he/she may reregister, and time-permitting, they will be given an additional 5/10 minutes, as appropriate. If a presentation is to be given in Hawaiian, an interpreter is available. In each meeting there will be a 10 minute break about half way through the meeting. Any written materials can be handed in at the meetings or sent to Dr. Lewis at DOE before 15 April 1992 to assure consideration. Each meeting was recorded by a court reporter, and tape and video recorders to assure an accurate record of presentations. If requested, the video recorder can be turned off. Transcripts of the meetings will be available in 21 reading rooms in Hawai'i and on the mainland. Attendees were invited to have their names placed on the EIS mailing list (sign up at registration desk) to receive any future EIS-related notices.

Ground Rules: The facilitator requests that those present be courteous to each other, that they do not interrupt speakers, and that they stay within the designated time limits. Private conversations and interviews should be conducted outside the meeting room. Dr. Lewis is available for interviews prior to each meeting and at the

breaks.

NEPA Background: The scoping meetings were shown to occur between the Notice of Intent (NOI) and the production of the Implementation Plan (IP). Following preparation of the IP, a Draft EIS (DEIS) will be prepared. After public review of the DEIS, a FEIS will be available for public review. A total of ten scoping meetings would be held with two each day in Pahoa, Wailuku, Kaunakakai, Honolulu, and Waimea (afternoon, 2-5:30 PM and evening 7-10:30 PM).

Turns meeting over to Dr. Lewis for further comment.

ATTACHMENT B

DOE PROJECT/PROCESS DESCRIPTION

HAWAII SCOPING MEETINGS

March 7, 1992, Pahoa, Hawai'i
March 9, 1992, Wailuku, Maui
March 12, 1992, Kaunakakai, Moloka'i
March 14, 1992, Honolulu, Oahu
March 16, 1992, Waimea, Hawai'i

Summary of Presentation

Introduction: After introducing himself as the Program Director for the Hawaii Geothermal Project Environmental Impact Statement (HGP EIS), Dr. Lewis began his presentation by stating that DOE's mission is "to prepare an Environmental Impact Statement (EIS) for phases 3 and 4 of the Hawaii Geothermal Project (HGP) as defined by the State of Hawaii in its proposal to Congress in 1989," noting that the Proposed Action had been defined by Congress (3/91) and the US District Court in Hawaii (6/91). He then explained that phases 1 [exploration, HGP(A)] and 2 [test of the feasibility of laying and retrieving the submarine cable] were complete. He noted that they were funded by DOE, the State of Hawai'i, and others and had undergone NEPA review. He stated that although phases 1 and 2 had had environmental review, they form an important data base and would be reexamined from the perspective of cumulative impacts. He also noted that the EIS would examine a range of reasonably foreseeable alternatives, both within and outside geothermal.

He then acknowledged Carol Borgstrom, Director of the Office of National Environmental Policy Act Oversight, DOE Headquarters], noting that she was assisted by Dr. Yvonne Weber, and also William Dennison [Assistant General Counsel for the Environment, DOE Headquarters], recognizing his assistance by Janine Sweeney. He introduced the representatives from DOE-OR (Andrea Campbell); ORNL, assisting in the preparation of the EIS (Dr. Amy Wolfe, Dr. Virginia Tolbert), and LBL, cable and alternatives (Mary Hunt). The latter were also to assist in recording highlights of scoping meetings.

EIS Process: Dr. Lewis described the EIS process. Initially an Advance Notice of Intent was published; 55 letters and hundreds of comments were received in response. Next were information exchange meetings with various civic, environmental, and Native Hawaiian groups, utilities, museums, developers, and potential cooperating agencies, including several federal, State, and County departments. At these meetings, concerns and issues were raised. He noted that several agencies would probably elect cooperating agency status. Cooperating agencies can include federal agencies, States, county governments and Native American Nations. He noted that although Native Hawaiians do not currently have Nation status, DOE would be holding many information

exchange meetings with Native Hawaiian groups, trying to accord them the status of cooperating status to the extent possible. These meetings were followed by a Notice of Intent announcing scoping meetings.

On Maui information exchange meetings included: Maui County officials, Blue Ocean Preservation Society, Campbell Estate, Coral Reef Foundation, Kaupo'o Ranch, Maui Tomorrow, Pele Defense Fund and Sierra Club.

Dr. Lewis then turned the meeting over to the Facilitator for process questions.